Method to Measure Wholesale Stored Energy

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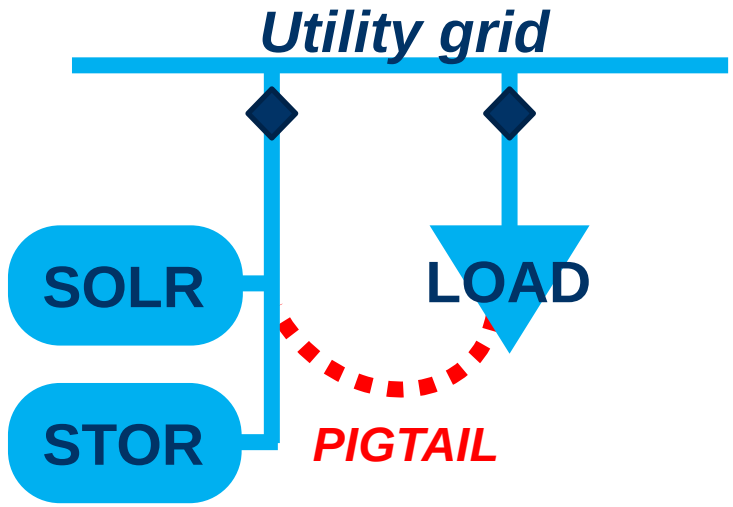
Intro to Pigtail

- Some generators connect directly to adjacent or on-site loads, esp. for emergency backup.
- Generator could be same owner as adjacent load, in which case “self supply”.
- Or Generator could be LSE whose sale through the pigtail is regulated by the state.
- Or Generator could fall under a state rule that exempts such direct sales from regulation (e.g., “On Site Generator” rules.
- With storage: what’s the method to measure wholesale stored energy vs. retail stored energy?



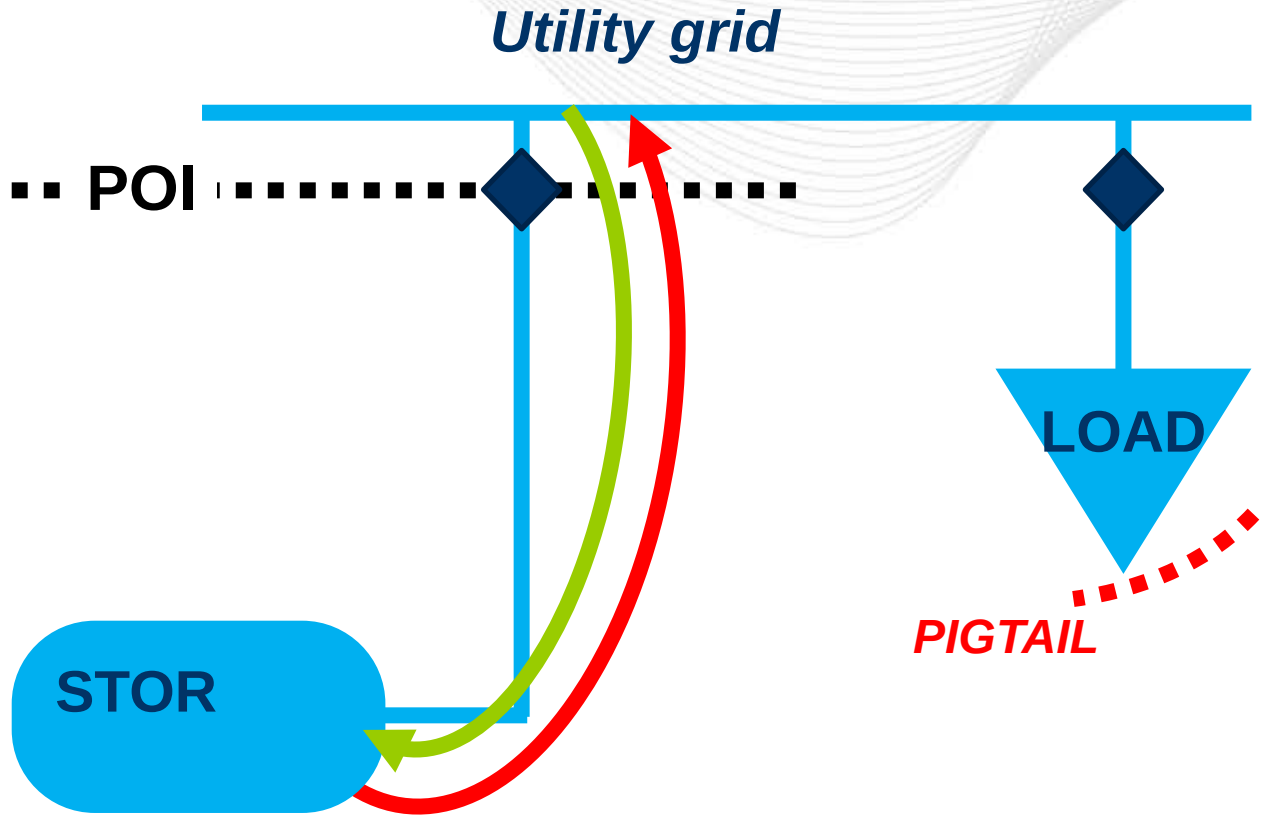
Definition

For current discussion, Wholesale Stored Energy is energy that is both:

1. Withdrawn from the grid.
2. Later released to the grid as part of a wholesale transaction.

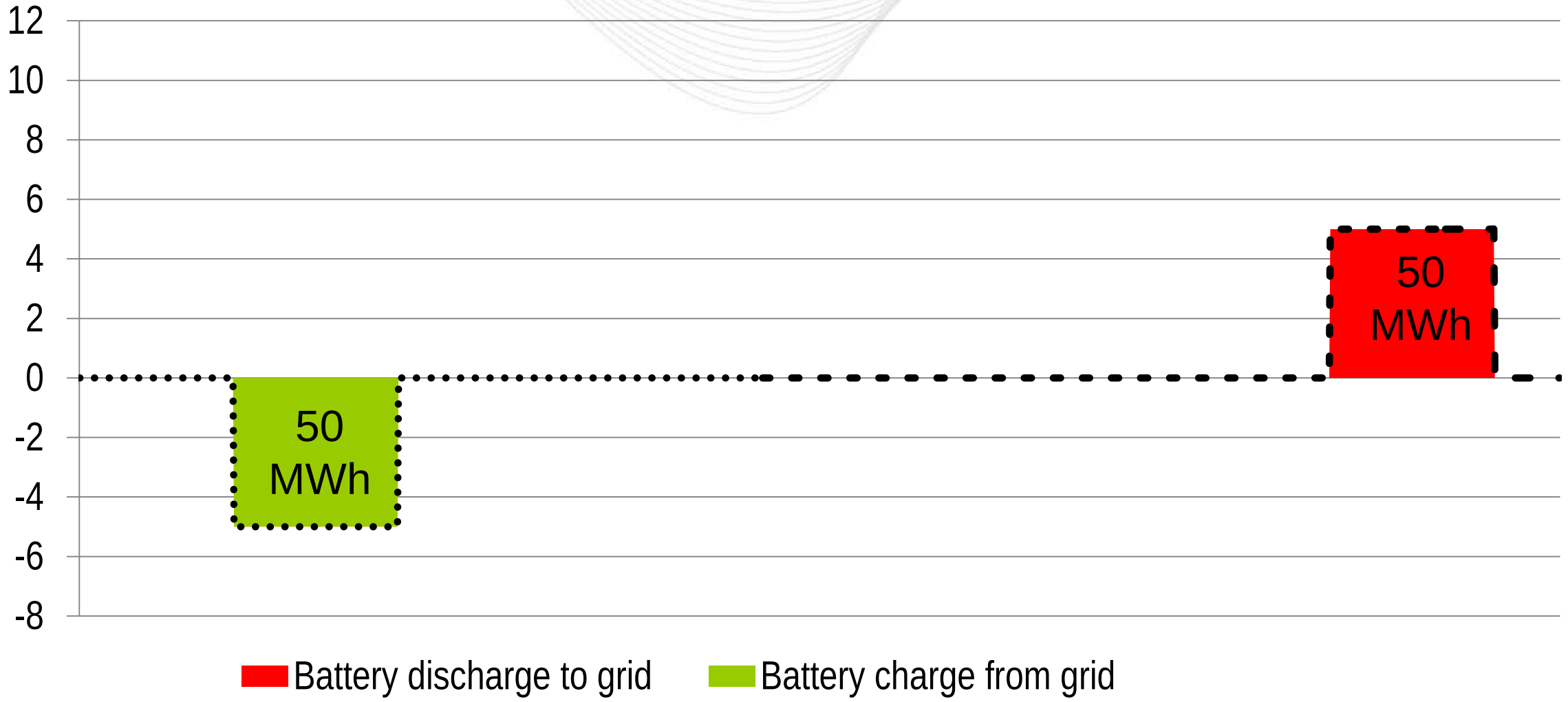
Use Case: Storage Alone

Definitions



Battery discharge to grid Battery charge from grid

Definitions



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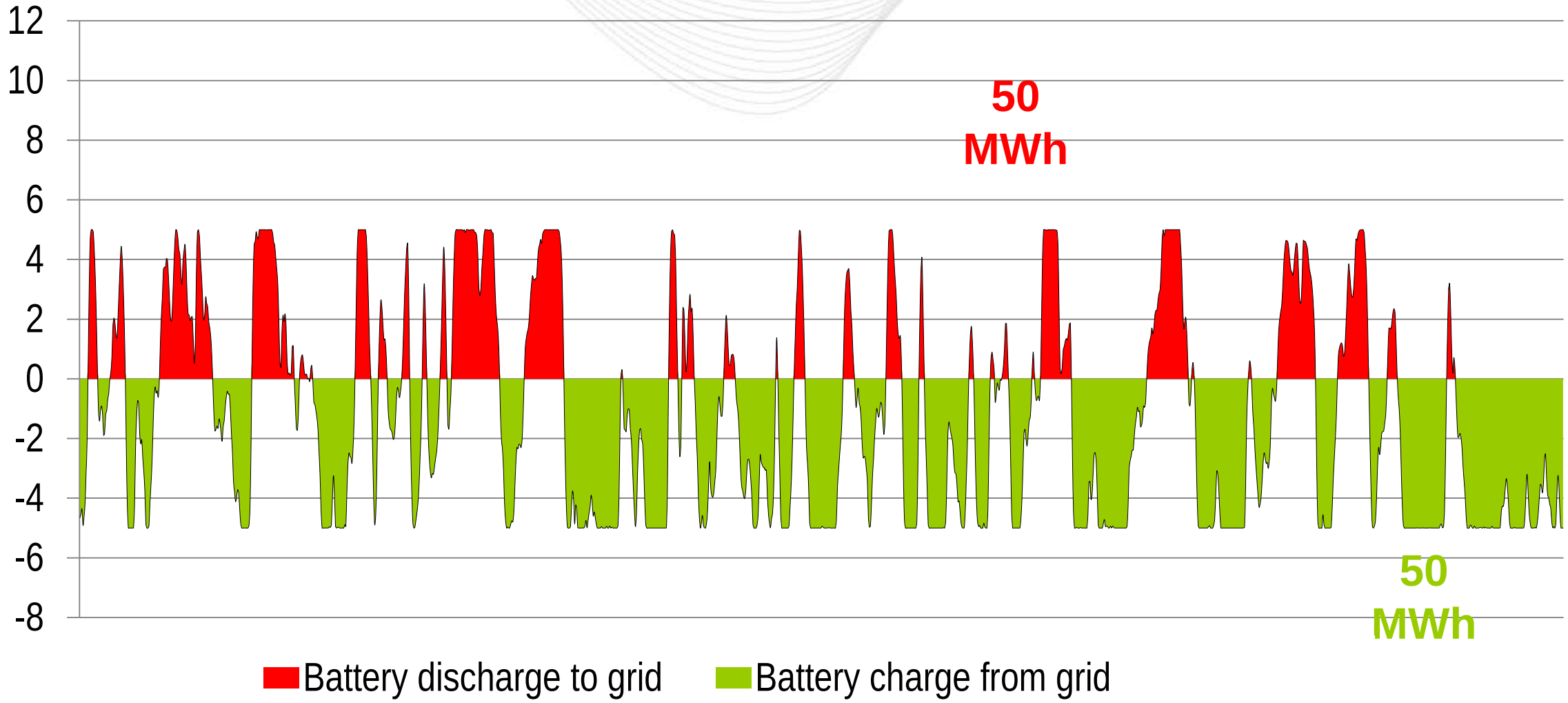
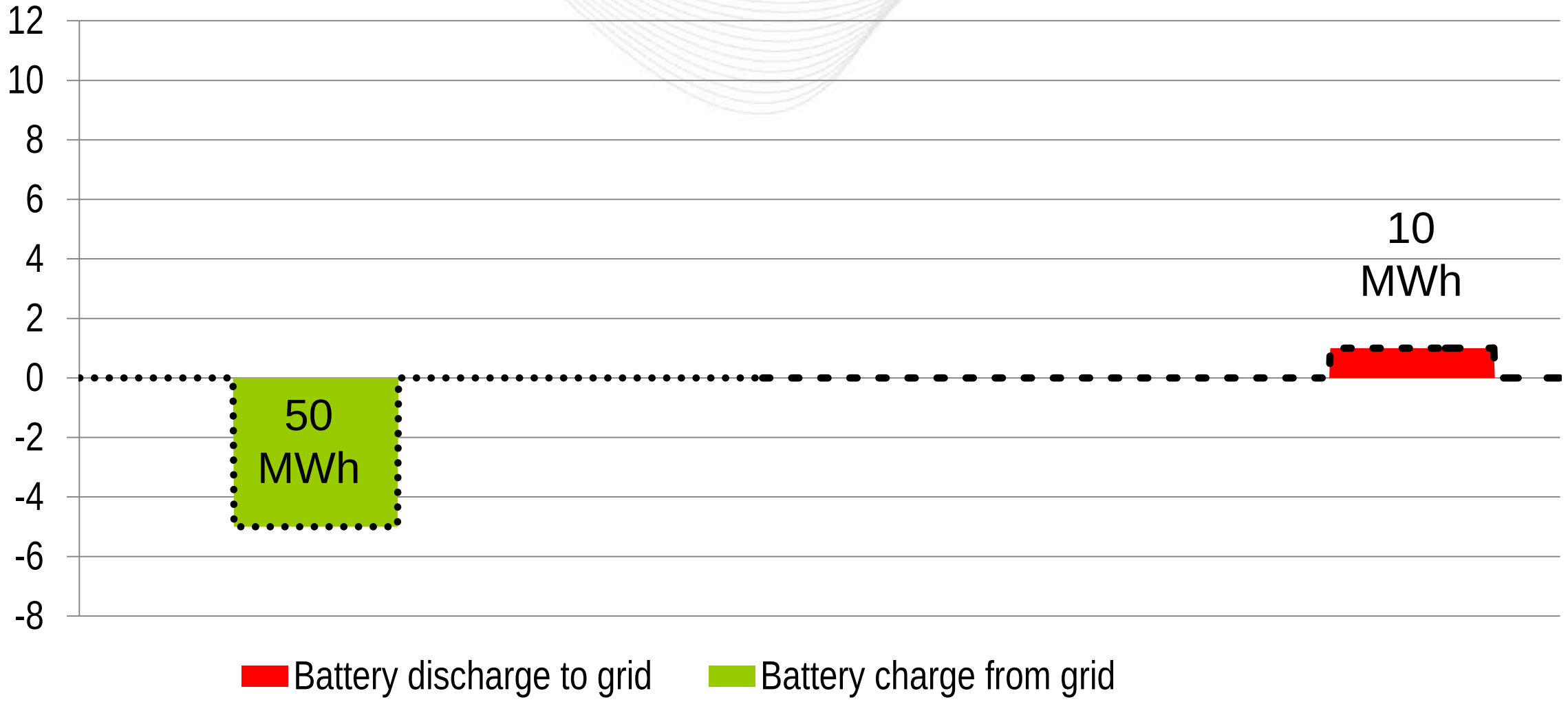
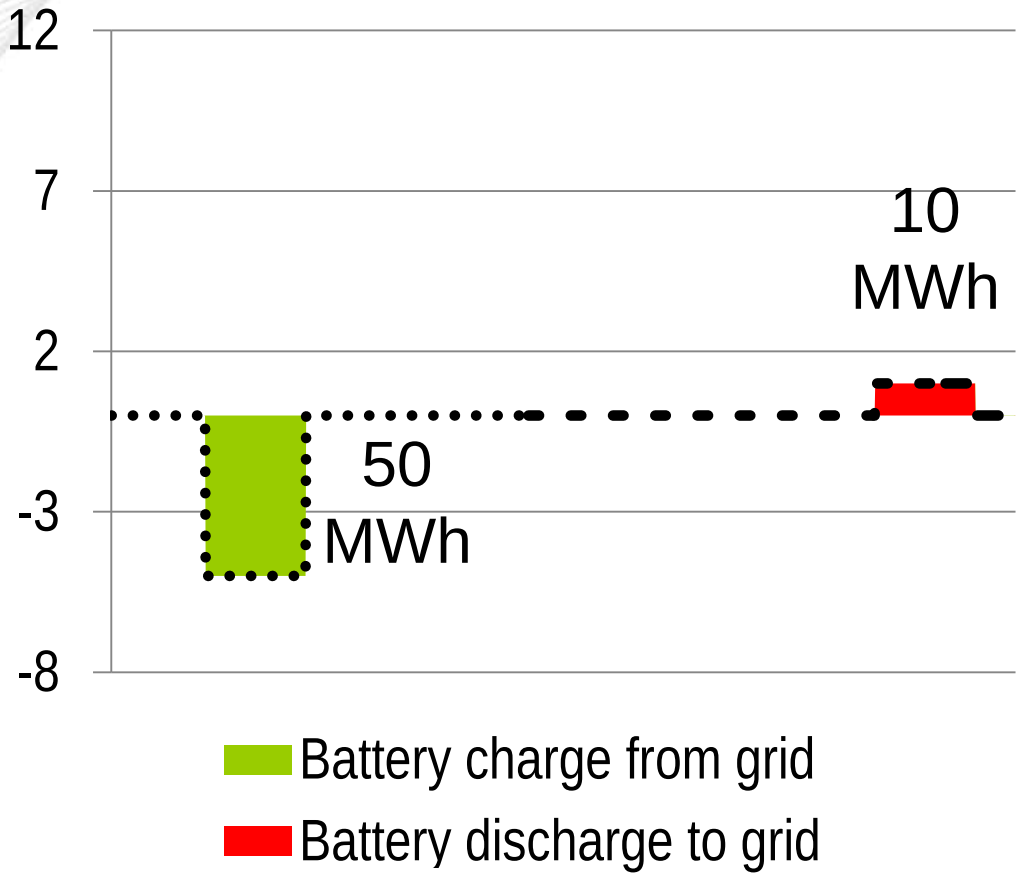


40MWh of Energy That's Not "Wholesale Stored Energy"



Method To Determine Wholesale Stored Energy

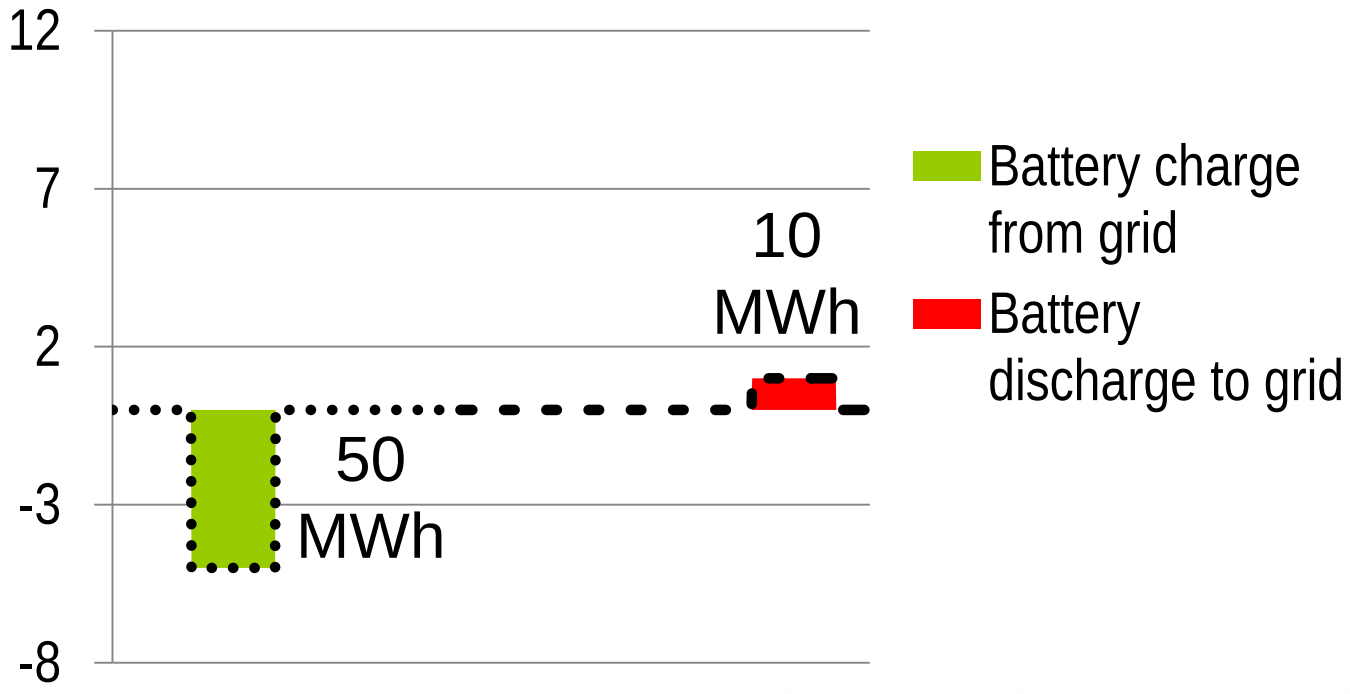
- General principle: Energy that the battery takes off the grid and later returns to the grid is “Wholesale Stored Energy”.
- The remaining energy is “Not Wholesale Stored Energy” and should be accounted for accordingly.
- Monthly net of (battery charge from grid) and (battery discharge to grid) = “Not Wholesale Stored Energy” = (battery station power withdrawals + other).
- The remaining withdrawals are “Wholesale Stored Energy”.

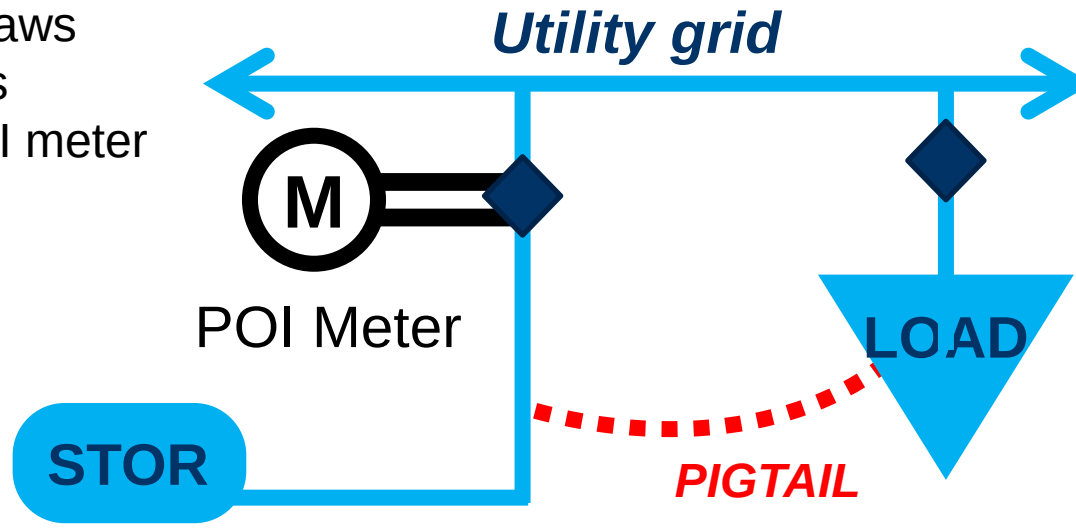


Meters and Method Details: Storage alone

Monthly net of MWh:
(battery charge from grid) - (battery discharge to grid) = (battery station power withdrawals + other).

Battery charge from grid = integrated POI value when POI withdraws
Battery discharge to grid = integrated POI value when POI injects
Possible measure of battery station power = monthly integral of POI meter

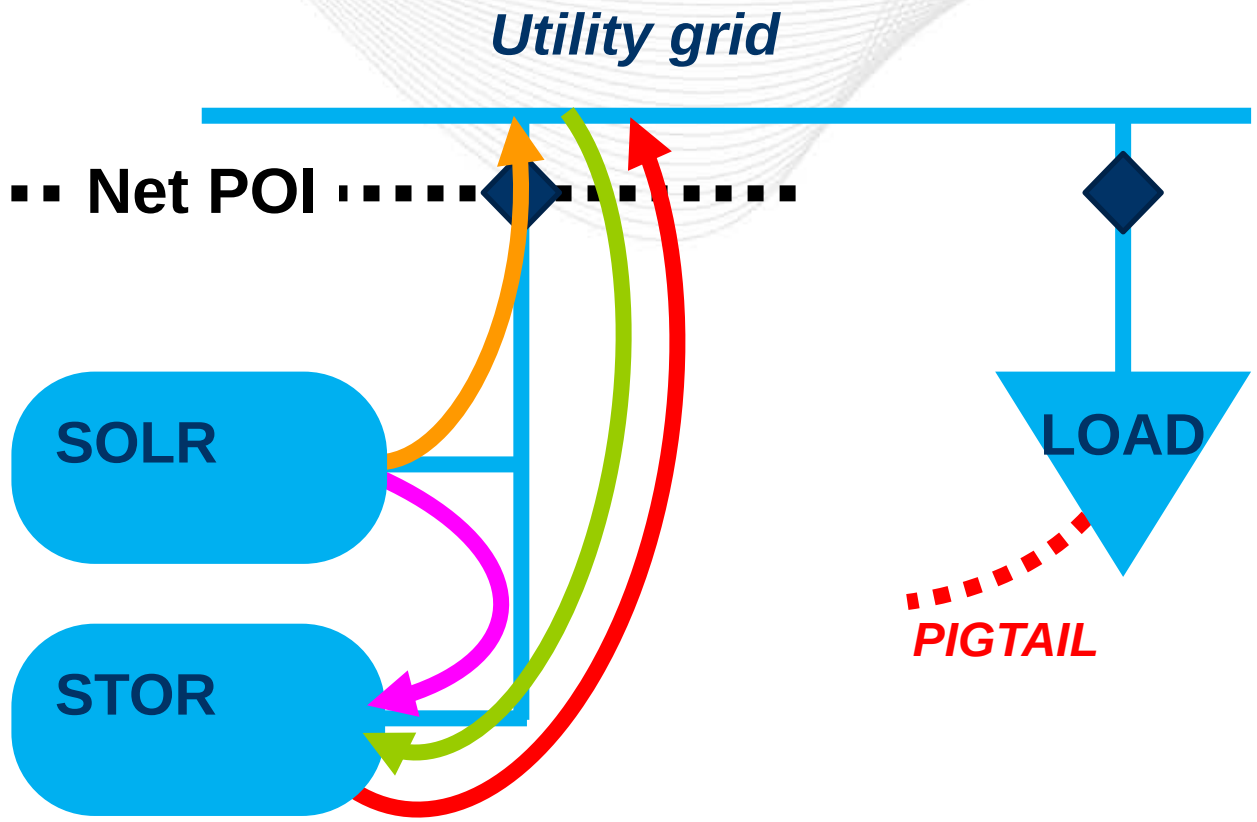




"Other" + "Battery Station Power" is net monthly negative energy position after all injections are netted against withdrawals.

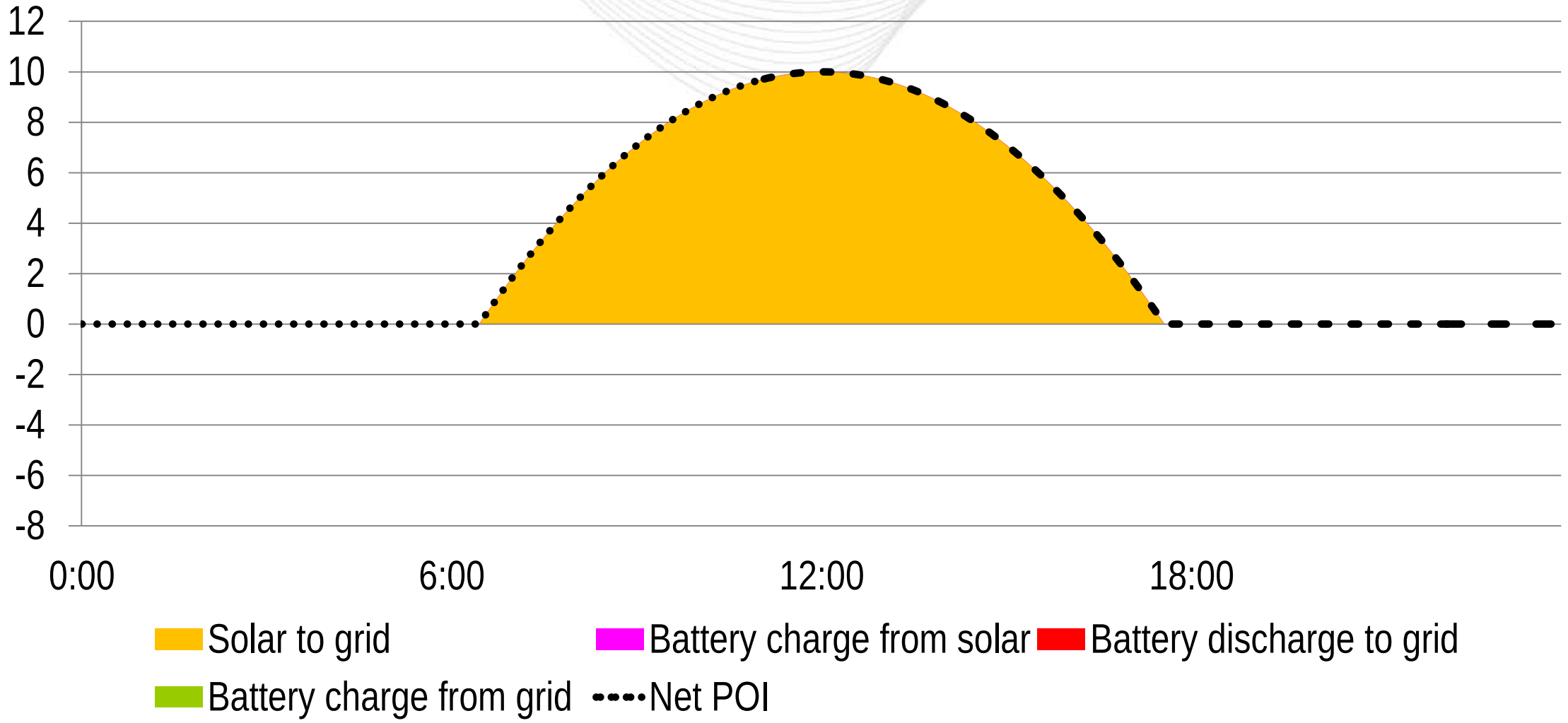
Use Case: Storage + Generator

Definitions

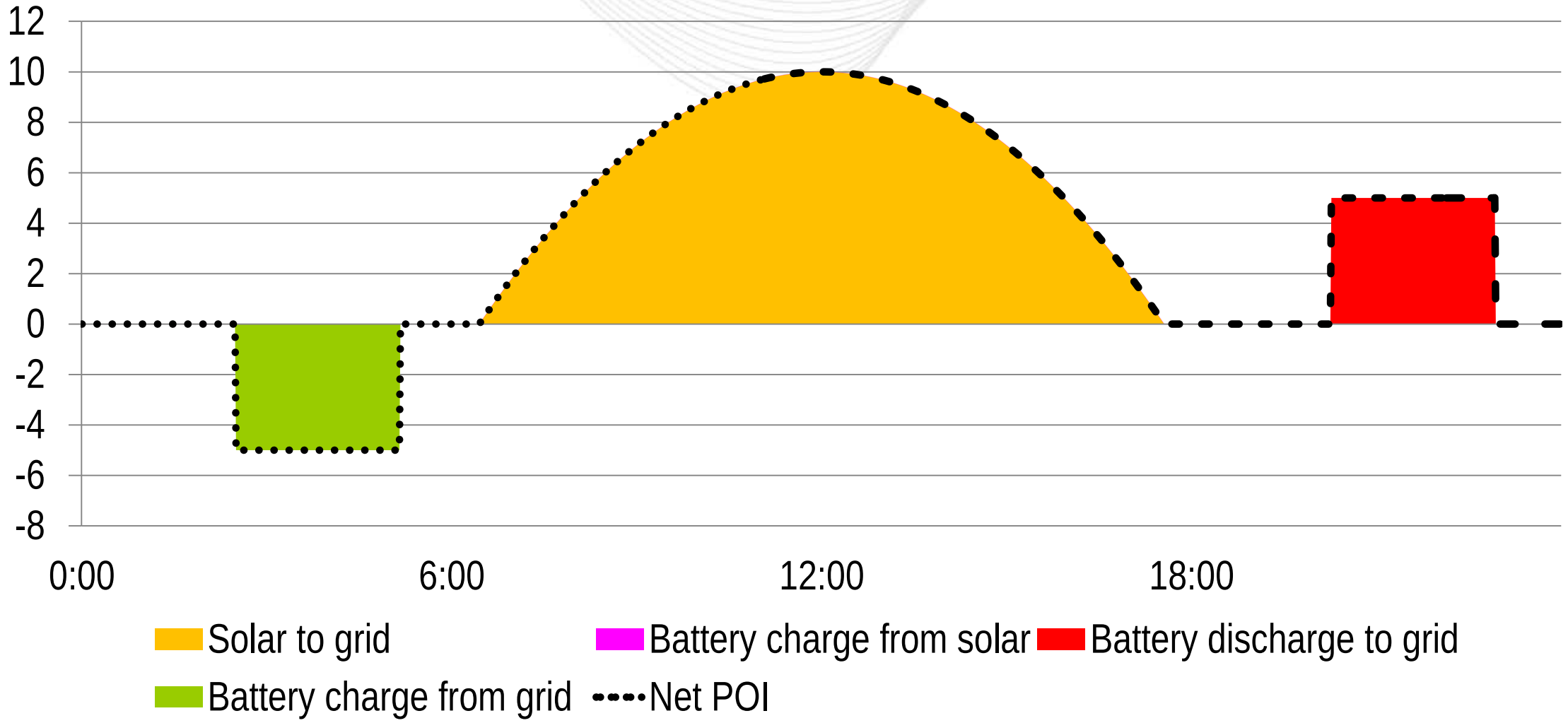


Solar to grid
Battery charge from solar
Battery discharge to grid
Battery charge from grid
Net POI

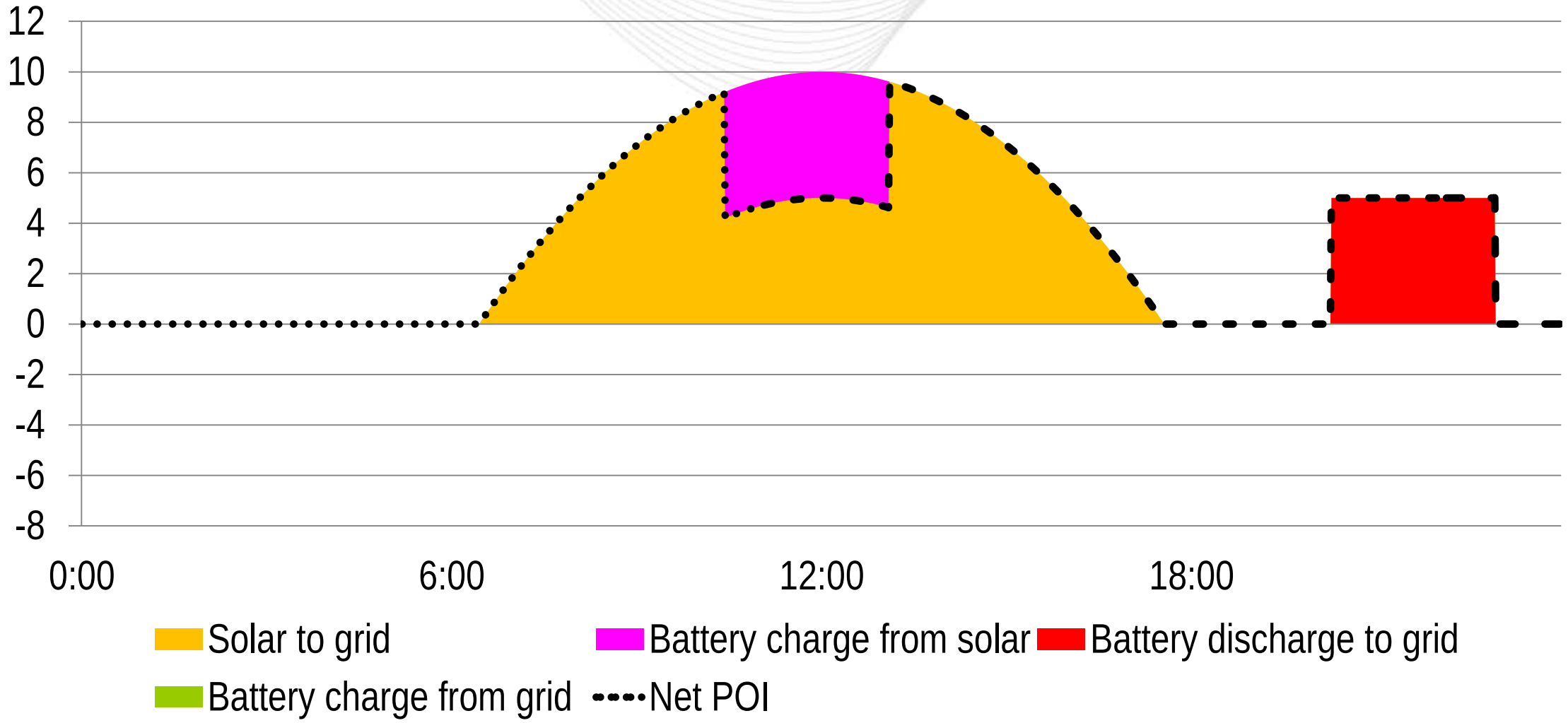
Example 1: “Solar to grid”



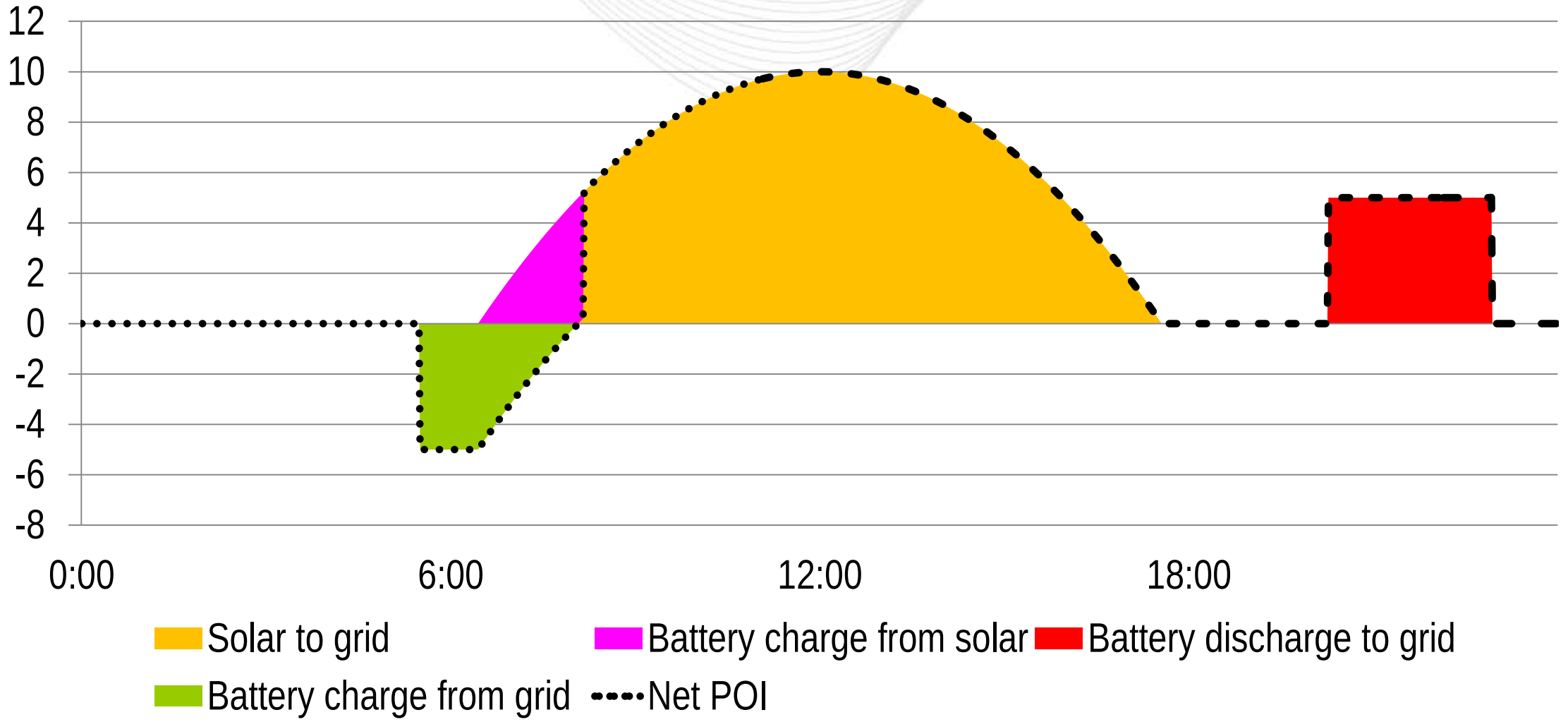
Example 2: “Battery Charge from Grid” and “Battery Discharge to Grid”



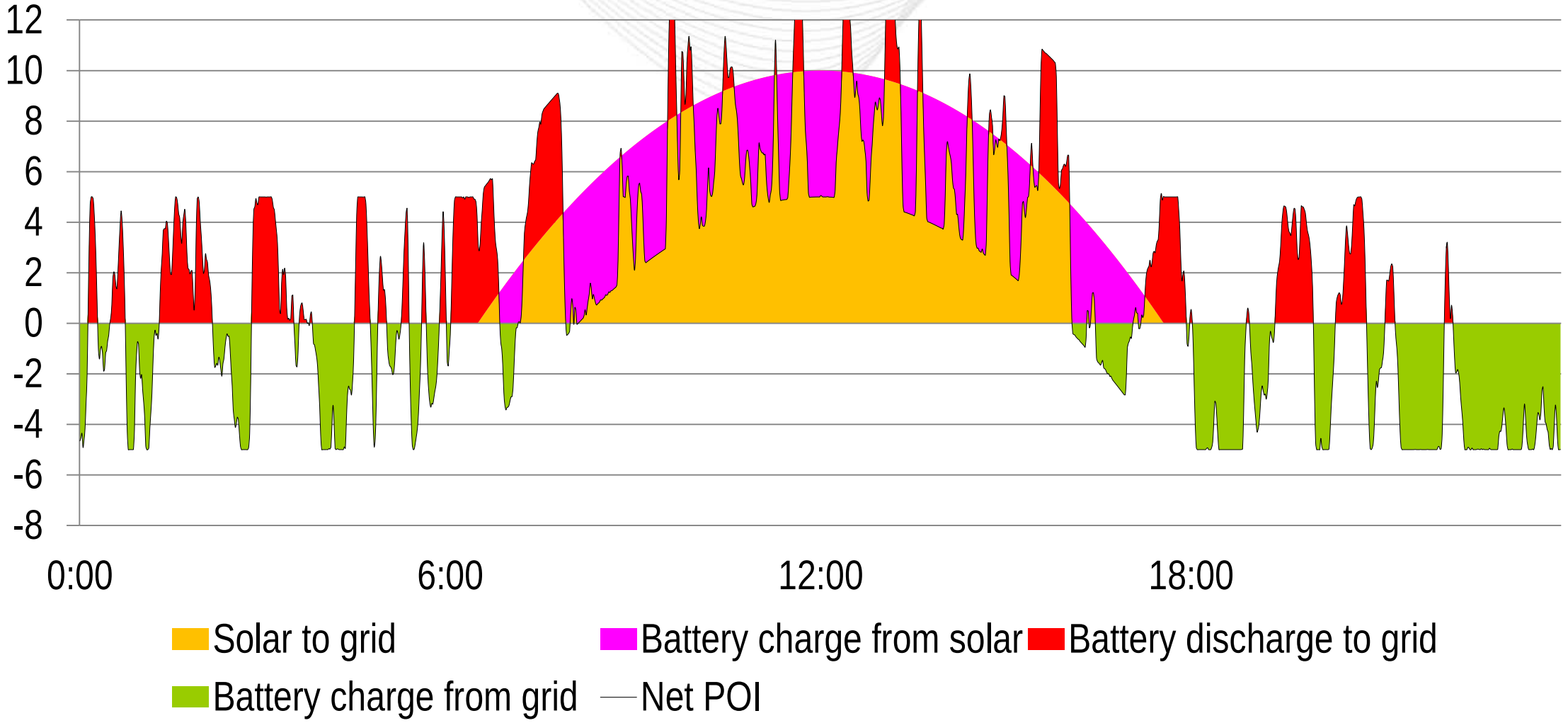
Example 3: Battery charge from solar



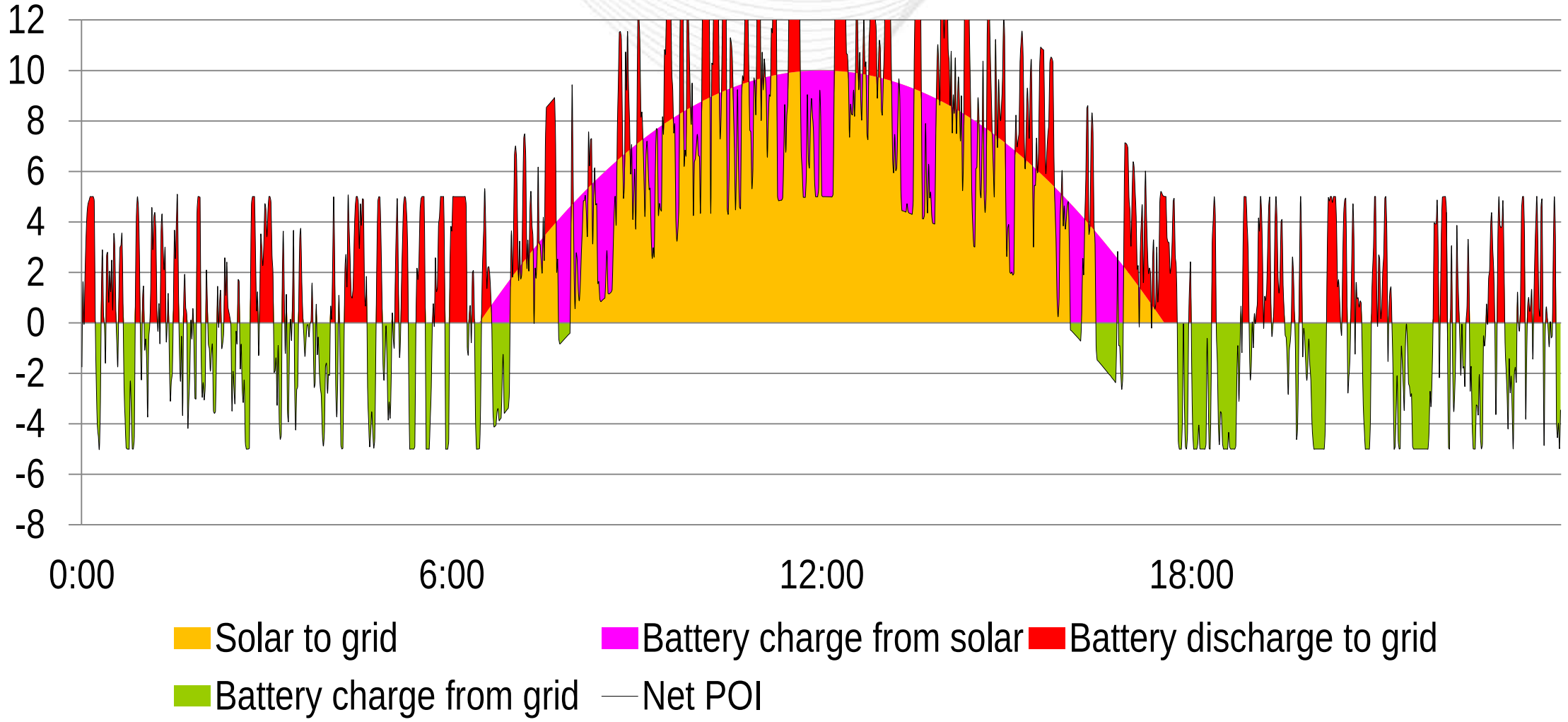
Example 4: Battery charging from solar & grid at the same time



Example 5: RegA + Solar



Example 6: RegD + Solar



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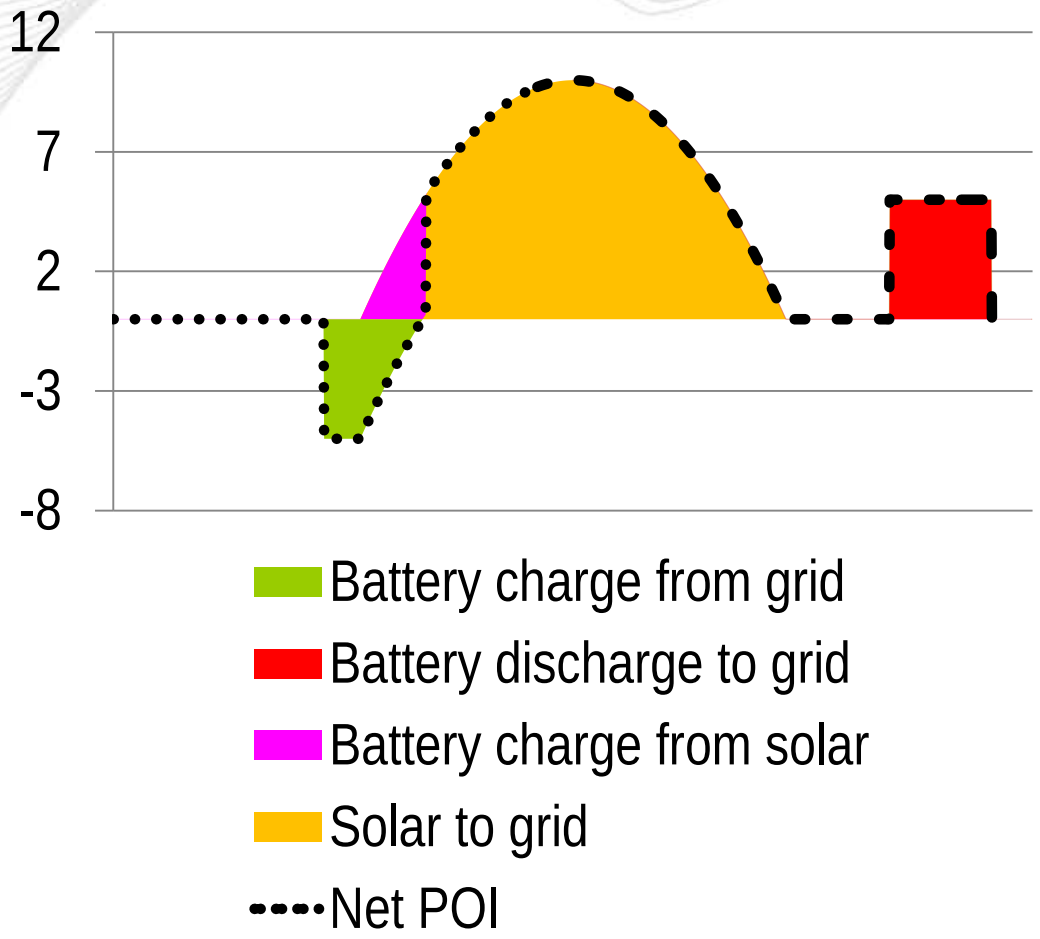

Meters and Method Details: Storage + Generation At Same Site

Monthly net of MWh:
(battery charge from grid) - (battery discharge to grid) = (battery station power withdrawals + other).

Battery charge from grid = integrated POI value when POI withdraws
Battery discharge to grid = integrated battery submetered value when battery discharging and POI injects
Possible measure of battery station power = monthly integral of POI meter